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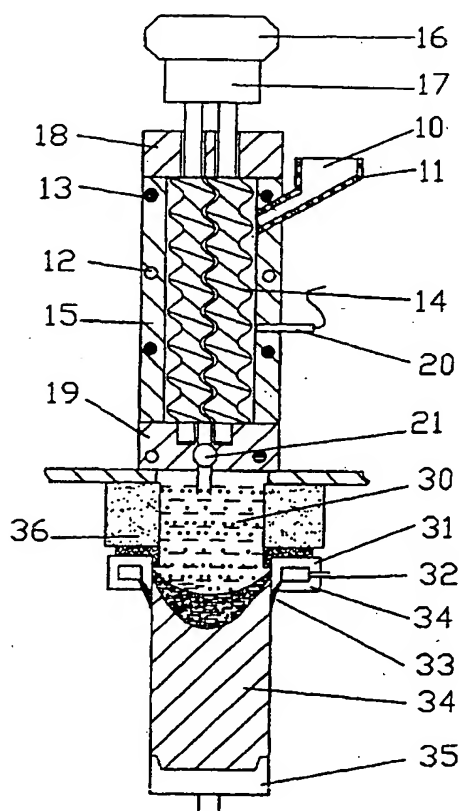
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[Continued on next page]

(54) Title: METHOD AND APPARATUS FOR MAKING METAL ALLOY CASTINGS



(57) Abstract: A method and apparatus are provided for fabricating of continuous castings with fine and uniform microstructure, which can be used as feedstock for secondary processing routes, such as thixoforming, forging and machining or direct application in industry. An overheated liquid alloy is fed into a high shear device (for example, a twin-screw extruder) and sheared intensively to produce a sheared liquid alloy or a semisolid slurry, wherein the sheared liquid alloy is at a temperature close to its liquidus and the semisolid slurry is then transferred to a shaping device for production of continuous castings with fine and uniform microstructures through a solidification process. The shaping device is any device capable of forming continuous (i.e. infinite length) products, such as a direct chill (DC) caster (2) (DC rheocasting) for production of continuous billets, an extrusion die (8) (rheo-extrusion) for production of continuous bars or wires, or a twin-roll caster (twin-roll rheocasting) for producing of continuous strips. In all those cases, the cross-section of the continuous castings exhibits a microstructure in which a controlled volume fraction of fine and spherical primary particles are uniformly distributed in a fine structured matrix.

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## INTERNATIONAL SEARCH REPORT

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## A. CLASSIFICATION OF SUBJECT MATTER

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## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

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## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No. |
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| Y          | <p>page 1184, right-hand column, last paragraph -page 1185, left-hand column, line 2; figure 2</p> <p>---</p> <p>-/--</p>  | 2-4, 6-8, 11, 14-16   |



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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No. |
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